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Docket No.: 331.1050
Date: March 30, 2007

AS
TW

In re application of: **Torsten GERLICH, et al**
Serial No.: 10/665,137
Filed: September 18, 2003
For: **CIRCUITRY CONFIGURATION FOR AN ELECTROMAGNETIC REGENERATION VALVE
ACTUATABLE BY PULSE-WIDTH MODULATION FOR VENTING THE TANK OF A MOTOR
VEHICLE**

Sir:

Transmitted herewith is a **Appellants' Brief under 37 C.F.R. §41.37 with Appendices A to C (10 pages)** in the above-identified patent application.

- ☐ Small entity status under 37 C.F.R. 1.9 and 1.27 has been previously established.
- ☐ Applicants assert small entity status under 37 C.F.R. 1.9 and 1.27.
- ☒ No fee for additional claims is required.
- ☐ A filing fee for additional claims calculated as shown below, is required:

- ☒ Also transmitted herewith are:
 - ☐ Petition for extension under 37 C.F.R. 1.136 (in duplicate)
 - ☒ Other: Return Receipt Postcard

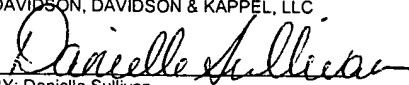
- ☐ Check(s) in the amount of \$0.00 is/are attached to cover:
 - ☐ Filing fee for additional claims under 37 C.F.R. 1.16
 - ☐ Petition fee for extension under 37 C.F.R. 1.136
 - ☐ Other:

- ☒ The Assistant Commissioner is hereby authorized to charge payment of the following fees associated with this communication or credit any overpayment to Deposit Account No. 50-0552.
 - ☒ Any filing fee under 37 C.F.R. 1.16 for the presentation of additional claims which are not paid by check submitted herewith.
 - ☒ Any patent application processing fees under 37 C.F.R. 1.17.
 - ☒ Any petition fees for extension under 37 C.F.R. 1.136 which are not paid by check submitted herewith, and it is hereby requested that this be a petition for an automatic extension of time under 37 CFR 1.136.


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I hereby certify that this correspondence and/or documents referred to as attached therein and/or fee are being deposited with the United States Postal Service as "first class mail" in an envelope addressed to "Mail Stop: APPEAL BRIEF - PATENTS, Commissioner for Patents, Alexandria, VA 22313" on March 30, 2007.

DAVIDSON, DAVIDSON & KAPPEL, LLC


BY: Danielle Sullivan



IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF PATENT APPEALS AND INTERFERENCES

Re.: Serial No.: 10/665,137 Confirmation No.: 5808
Applicant: Torsten GERLICH, et al.
Filed: September 18, 2003
Art Unit: 2836
Examiner: Zeev V. Kitov
Attorney Docket No.: 331.1050
Customer No.: 23280

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Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

March 30, 2007

APPELLANTS' BRIEF UNDER 37 C.F.R. § 41.37

Sir:

Appellants submit this appeal brief for the consideration of the Board of Patent Appeals and Interferences (the "Board") in support of their appeal of the Non-Final Rejection dated November 30, 2006 in this application. The statutory fee of \$500.00 has been previously paid with the appeal brief dated February 15, 2006 and should be applied to this new appeal brief.

1. REAL PARTY IN INTEREST

The real parties in interest are Carl Freudenberg KG, a German Corporation having their place of business at Hoehnerweg 2-4, Weinheim, Germany, the assignees of the entire right, title and interest in the above-identified patent application. The invention was assigned by inventors Torsten GERLICH, Christopher KLATT, Ralf HEINRICH and Christoph KLESEN to Carl Freudenberg KG. The assignment was recorded on January 8, 2004 at reel 014861, frame 0865.

2. RELATED APPEALS AND INTERFERENCES

Appellants, their legal representatives, and assignee are not aware of any appeal or interference that directly affects, will be directly affected by, or will have a bearing on the Board's decision in this appeal.

3. STATUS OF CLAIMS

Claims 1 to 8 are pending. Claims 1 to 8 have been rejected as per the Non-Final Office Action dated November 30, 2006.

The rejection to claims 1 to 8 thus is appealed. A copy of appealed claims 1 to 8 is attached hereto as Appendix A.

4. STATUS OF AMENDMENTS AFTER FINAL

No amendments have been made since the last Final Office Action rejection dated May 4, 2006.

A notice of appeal was filed on September 27, 2006 after the final rejection but no claims were amended.

5. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 recites an electromagnetic regeneration valve (Fig. 1) for venting a tank of a motor vehicle, the regeneration valve being actuatable by pulse-width modulation and having a pulsed mode and a proportional mode having a higher frequency than the pulsed mode comprising: a solenoid (represented by R_{sp} and L_{sp} Fig. 1, see e.g., specification at page 4, lines 16 to 17), and circuitry configuration including: i) a power source (see U_b of Fig. 1, see e.g., specification at page 4, lines 20 to 21) for supplying the solenoid with electricity; ii) a control unit for generating pulse-width-modulated signals (see U_s of Fig. 1 for example); iii) a switching device (see e.g., power transistor in specification page 4, lines 18 to 21), the

solenoid capable of receiving the pulse-width-modulated signals of the control unit via the switching device; and iv) a suppression device (see for example D_f in Fig. 1; see e.g., specification page 4, lines 17 to 18) suppressing high induced voltages at the solenoid, the solenoid in the proportional mode having a position corresponding to a mean current level (See: e.g., specification page 1, lines 6 to 8; specification page 2, lines 10 to 12; specification page 2, lines 25 to 26).

6. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

Whether claims 1 to 3, 7 and 8 should be rejected under 35 U.S.C. §103(a) as being unpatentable over Busato (WO 99/06893) in view of Horowitzh et al. textbook, The art Electronics, and Shacklock et al. (US 5,231,722).

Whether claims 5 and 6 should be rejected under 35 U.S.C. §103(a) as being unpatentable over Busato in view of Horowitzh et al., Shacklock et al. and Klotz et al. (US 4,915,204).

Whether claim 8 should be rejected under 35 U.S.C. §103(a) as being unpatentable over Busato in view of Horowitzh et al., Shacklock et al. and Maller (US 6,256,185).

Whether claim 4 should be rejected under 35 U.S.C. §103(a) as being unpatentable over Busato in view of Horowitzh et al., Shacklock et al. and Butts et al. (US 4,796,853).

7. ARGUMENTS

Rejections under 35 U.S.C. §103

A. Claims 1 to 3, 7 and 8

Claims 1 to 3, 7 and 8 were rejected under 35 U.S.C. §103(a) as being unpatentable over Busato (WO 99/06893) in view of Horowitzh et al. textbook, The Art of Electronics, and Shacklock et al. (US 5,231,722).

Busato is discussed in the present specification at [0005].

Horowitzh et al discloses electromechanical devices.

Independent claim 1 of the present invention recites “an electromagnetic regeneration valve for venting a tank of a motor vehicle, the regeneration valve being actuatable by pulse-width modulation and having a pulsed mode and a proportional mode having a higher frequency than the pulsed mode comprising:

a solenoid, and circuitry configuration including:

a power source for supplying the solenoid with electricity;

a control unit for generating pulse-width-modulated signals;
a switching device, the solenoid capable of receiving the pulse-width-modulated signals of the control unit via the switching device; and
a suppression device for suppressing high induced voltages at the solenoid, the solenoid in the proportional mode having a position corresponding to a mean current level.”

In solenoid controls such as in Busato, where both high and low frequency signals are used for two modes of control (See Busato at page 6, line 15 et seq.), voltage suppression devices have generally been regarded as not desired as they have been thought of to interfere with the fine response required. See [0010] of the present specification: “The use of free-wheel diodes is a known process in valve engineering and generally serves the purpose of protecting the power circuit breakers which control the current against the high induced voltages which occur as the valve reverses. It is also known that this measure results in *undesirable lengthening of the coil reaction time.*”

As stated by the present specification at [0011], it has surprisingly been found that the use of the free-wheeling diodes in proportional and pulsed mode control devices actually *reduces noise* for the control signals while still permitting adequate response times.

Generally, the highly controlled Busato device has not been seen as needing suppression devices as the voltage is controlled via pulse modulation, and also it was thought that suppression devices would impact the response times.

Horowitzh et al. confirms this and teaches away from the present invention: a diode “protection circuit lengthens the decay of current through the inductor.” (See Horowitzh page 53, col. 1, lines 1 to 3). There is absolutely no teaching in Horowitzh et al. at all or Busato to use a suppressing device with pulse modulation, and Horowitzh et al. actually teaches away from such a modification. The Figure 2.4 description is related to load switching and clearly not to pulse modulation where lengthening the current decay is clearly disadvantageous.

Shacklock et al., as admitted in the Office Action on page 4, receives proportional pulse-width modulation signals, i.e. operated in a proportional mode, and not the pulse mode of the present invention. With pulsed mode as opposed to proportional mode, the use of such diodes is not desired as taught by Busato and Horowitzh et al. As admitted by the Office Action, Shacklock et al. is not for a pulsed mode, nor would such pulsed modes be used for a washing machine. Engine valves desire much more accuracy.

Furthermore there is no motivation to combine Busato, Horowitzh et al. and Shacklock et al, as Shacklock et al. is for a washing machine.

Withdrawal of the rejection to claim 1 and its dependent claims is respectfully requested.

Claim 4 Argued Separately

Claim 4 was rejected under 35 U.S.C. §103(a) as being unpatentable over Busato in view of Horowitzh et al., Shacklock et al, and Butts et al.

In view of the comments with respect to claim 1, withdrawal of the rejection is respectfully requested.

Moreover, the statement on page 6 of the Office Action, “the reference is pertinent to the instant case since it faces the same problem, i.e. providing a proportional and pulse control of the solenoid valve,” is not understood. There appears to be only one pulse width modulation control, not two modes. There is no motivation to combine Butts et al. with Busato, Horowitzh et al. and Shacklock et al.

Claims 5 and 6 Argued Separately

Claims 5 and 6 were rejected under 35 U.S.C. §103(a) as being unpatentable over Busato in view of Horowitzh et al., Shacklock et al. and Klotz.

In view of the comments with respect to claim 1, withdrawal of the rejection is respectfully requested.

Moreover, Shacklock et al. is for a washing machine controller and not relevant to the claim 5 and 6 limitations. There is no motivation to combine Klotz with Busato, Horowitzh et al. and Shacklock et al. The proposed motivation on page 5 of the Office Action, “because such application would substantially expand the market of the Maller control system manufacturer,” is not understood for this rejection *and is in clear error*.

Claim 8 Argued Separately

Claim 8 was rejected under 35 U.S.C. §103(a) as being unpatentable over Busato in view of Horowitzh et al., Shacklock et al. and Maller.


In view of the comments with respect to claim 1, withdrawal of the rejection is respectfully requested.

Furthermore there is no motivation to combine Maller with Busato, Horowitzh et al. and Shacklock et al, nor does any seem to be provided by the Office Action.

CONCLUSION

It is respectfully submitted that the application is in condition for allowance.
Favorable consideration of this appeal brief is respectfully requested.

Respectfully submitted,
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APPENDIX A

PENDING CLAIMS 1 TO 8 OF U.S. APPLICATION SERIAL NO. 10/665,137

Claim 1 (previously presented): An electromagnetic regeneration valve for venting a tank of a motor vehicle, the regeneration valve being actuatable by pulse-width modulation and having a pulsed mode and a proportional mode having a higher frequency than the pulsed mode comprising:

- a solenoid, and circuitry configuration including:
 - a power source for supplying the solenoid with electricity;
 - a control unit for generating pulse-width-modulated signals;
 - a switching device, the solenoid capable of receiving the pulse-width-modulated signals of the control unit via the switching device; and
 - a suppression device for suppressing high induced voltages at the solenoid, the solenoid in the proportional mode having a position corresponding to a mean current level.

Claim 2 (previously presented): The electromagnetic regeneration valve as recited in claim 1, wherein the suppression device includes a free-wheeling diode connected in parallel to the solenoid.

Claim 3 (previously presented): The electromagnetic regeneration valve as recited in claim 1, wherein the regeneration valve is actuatable in the proportional mode with a pulse frequency of between 20 Hz and 200 Hz.

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Claim 4 (previously presented): The electromagnetic regeneration valve as recited in claim 3, wherein the regeneration valve is actuatable with a pulse frequency of about 50 Hz.

Claim 5 (previously presented): The electromagnetic regeneration valve as recited in claim 1, wherein the power source includes the vehicle's electrical system.

Claim 6 (previously presented): The electromagnetic regeneration valve as recited in claim 1, wherein the control unit includes an engine controller.

Claim 7 (previously presented): The electromagnetic regeneration valve as recited in claim 1, wherein the switching device includes a power transistor.

Claim 8 (previously presented): The electromagnetic regeneration valve as recited in claim 7, further comprising a further diode connected in parallel to the power transistor.

APPENDIX B

Evidence Appendix under 37 C.F.R. §41.37 (c) (ix):

No evidence pursuant to §§1.130, 1.131 or 1.132 and relied upon in the appeal has been submitted by appellants or entered by the examiner.

APPENDIX C

Related proceedings appendix under 37 C.F.R. §41.37 (c) (x):

As stated in “2. RELATED APPEALS AND INTERFERENCES” of this appeal brief, appellants, their legal representatives, and assignee are not aware of any appeal or interference that directly affects, will be directly affected by, or will have a bearing on the Board's decision in this appeal.